tion of the works of the Greeks,—a result which might have been anticipated from the analogy between the habits of thought and feeling, and even language, which may be traced between the two nations.

The honorary secretary, Mr. Bailey, announced the following as the subjects for essays for medals of the Institute:—

1. On the application of sculpture to architecture, and the principles which should regulate its introduction in buildings generally, with regard to beauty of embellishment and propriety of style and character.

2. On the theory and practice of constructing chimneys, particularly in dwelling-houses, with regard to the formation of fire-places, flues, and all the parts connected therewith, in order to insure sufficient draught and exit of the smoke.

The essay to contain detailed statements of experiments and practical results.

The Soane medallion will be given for the best design for a building, to contain public baths, on a comprehensive scale, with all suitable accessories, combining the magnificence of the ancients with the usages and purposes of modern times.

Respecting the royal medal, the secretary said, no communication could be made at present, as the council had not yet come to a decision with respect to its appropriation.

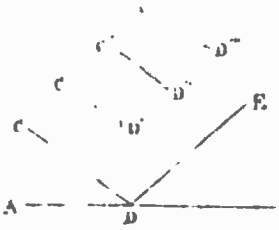
We have reason to believe that the council have fallen into the view we took of the subject last year,* and that this medal will be made an object of ambition open to the whole profession.

## REFLECTION OF SOUND.

In the very interesting and suggestive paper read at the Royal Institute of British Architects, "On the Construction of Buildings with reference to the Laws of Sound," Mr. Scott Russell stated, that it had hitherto been taken for granted that sound was reflected under the same laws as light, or billiard balls from the cushions of the billiard-table; he had, however, by sundry experiments, arrived at the conclusion that sound was promulgated through the air in waves, in a manner analogous to that in which waves of the first order moved in water: upon these water-waves he had several times experimented, and found that the theory of reflection above mentioned was in this respect but partially correct, inasmuch as reflection only occurred when the angle of incidence was greater than 45° degrees; for when it was less than 45° the wave of water was no longer reflected, but assumed a rolling motion along the plane against which it was projected. This, he said, was from analogy, applicable to sound, although such a theory was not philosophically acknowledged. He, moreover, added, that although such was undoubtedly proved, by the results of his experiments, to be the case, yet he could not offer any explanation of the cause.

Now, it appears to me, that the wave of sound cannot be considered analogous to a ray of light which strikes upon a plane in one point, and is reflected from the same point in the well-known manner; nor as the billiard ball, which impinges the cushion at a certain point, and is immediately reflected from it as the ray of light from the plane; but it must be considered as a force which may be described as of continuous progression, inasmuch as the wave is not a solid body, the whole of whose molecules would be acted upon simultaneously, but, on the contrary, it is a body, part of which may be already reflected whilst the rest is still in a progressive motion.

Now, if AB represent a plane, and CD the direction of a billiard ball, impinging at D, the ball would be reflected in DE; *i.e.* ADC = BDE, and proceed in a direct line from the point D, with a certain impetus or force, which I will call F. If, however, we suppose that whilst the force F, *i.e.* the ball, is proceeding in the direction DE, it is subjected to the influence of several other forces, represented by $f, f'' f'''$, acting respectively in the directions C'D', C''D'', C'''D''', as is obviously the case in the continuously progressing wave, these forces, $f, f'', f'''$, must undoubtedly have some effect upon the direction of the reflected force F; and let us notice *how* these forces will affect it, and we shall find Mr. S. Russell's deduction perfectly correct; for it is obvious, that when CDA ∧ 45°, then CDE ∠ 90°, and the forces $f, f'', f'''$, acting upon the direction of the force F at such an angle, would increase the intensity of the force F in an outward direction, *i.e.* from the plane (similarly to a force acting obliquely on the plane of a wedge, or a head-wind upon the sails of a ship), and the wave of sound would consequently be reflected; but if, on the other hand, we have CDA ∠ 45°, then CDE ∧ 90°, and the forces $f, f'' f'''$, will evidently impel the force, F, inwards from the




direction DE; that is, prevent the sound being reflected. What has been shewn for the force F might be shewn for the forces of each and all of the molecules of the progressing wave, and will lead to the conclusion, that so long as ADC (or angle of incidence) ∧ 45°, the posterior position of the wave in progression will drive the anterior portion, already reflected, away from the plane it strikes; and that when, on the contrary ADC (or angle of incidence) ∠ 45°, the portion of the wave in progression will constantly impel the part of the wave reflected towards the plane, and cause the result described by Mr. S. Russell.

In reference to echoes, it may be interesting to mention, that in Woodstock Park there is an echo which at night will repeat twenty syllables very distinctly; there is also said to be an echo near Glasgow, which will thrice return a tune played on a trumpet.

ηχεω.

* Vol. IV., p. 335.

## ON BEAUTY—THE BEAUTIFUL.

[PARAPHRASED FROM WINCKELMANN.]

"Beauty may be reduced to certain fundamental principles, but not fathomed by any especial explanation. Generally it is said, that it consists in the mutual coincidence of any being with its scope, the parts with each other and the whole.—Every one, therefore, will acknowledge, that the cause of beauty, which may be considered as identical with perfection—is not to be sought for *without* beauty (*ausser der Schönheit*), as it is to be found in all things created. Conceding this, we have yet to premise, that 'THE HIGHEST BEAUTY IS ALONE IN GOD.'"—*Winckelmann. "History of Ancient Art."* 1765, iv., 5, 6.

On reflecting on the purport of these ideas and words, and all the associations connected with them—we may again exclaim, how beautiful! All, whatever gave us joy and pleasure, and elation and edification, comes within their category, which comprises the whole sun-side of human existence. But we are compelled by our scope—and candidly confess, by the vastness of the subject—to contain ourselves within certain limits. *Beauty—the beautiful!* We do not intend—wish not, to enter on an inquiry, why a sunrise is beautiful in nature, or why Schiller exclaimed on the infuriated waters of the Elbe during a gale, "Beautiful, beautiful!" Aside all this beauty and grandeur of nature, lies the beautiful in art—the beautiful made by man's exertions, at man's hand; and it is not in vain, that genius is called creative, as it puts itself thus beside and akin to a power, even surpassing his conception. But art-beauty (*die* Kunst-Schöne), again, is of a multifarious kind, most of which also, we must lay aside—beauty of diction, graphic composition, the sweetness of tones; even that art, which, on a piece of canvass can make our eyes perceive a vastness of objects, even dive into perspectives which do not exist—save in our mind. It is on the art-piling up of materials for *structural* purposes—and the moulding of substances into a more or less nature-shape (sculpture), that we may dilate in the present place. Neither shall we grind over what has been (a thousand times) said historically and *objectionally* on these subjects, but ask at once: "What is beautiful in art—what do we call beautiful in art?" What, however, art itself is, must be first adverted to. And thus we say, that although *imagination* is highly extolled by our kind, and every thing wondersome or strange ascribed to it—yet it is to be borne in mind, that its province, its scope, is not an *absolute*, independent or *autochtonic* one, cannot be so, as nothing is independent in nature (the world)—but *nature* herself. Thus art has its basis in nature; it can not issue from it, nor transgress it—perhaps, hardly ever surpass it. But there is no *emulation* with or about nature—*can* not be!

If we consider things existing (nature), we shall find amongst its numberless laws, one or two, which we shall advert to here—as being exceedingly comprehensive and far-reaching. Nature, then, *first* impells every existing thing to push its existence (being) to the very highest degree of—inward and outward, which are synonymous—perfection. And *second*, nature accomplishes all her aims by most concise and well-managed means. As we intend to begin with the beautiful in architecture, we shall speak of the latter law first. But we have to repeat—that architecture (like any other art-branch) is nothing absolute, independent, or autochtonic; it took its rise, historically and didactically, from nature, and by its rules it must abide. What is the column, the capital, the architrave—the arch? Why—they are all fore-typed (foreshadowed) in nature; every one of them. Look at the ruins at *Debut* and *Gartas* in Nubia, as represented in Gau's splendid work—monuments coeval with, if not anterior to the oldest Egyptian temples. What are the capitals of these columns—but the very representation of those palms, which even now grow in the immediate neighbourhood? There they are—the rudiments of the petioli of their leaves, as they appear in any adult tree. But can a palm tree be beautiful? Certainly it can—*it is*. But when? Will, or can we, even call such a tree beautiful, if it is stunted and stinted in its growth, ventricose or contracted at any of it parts, leafless, and so on. Any of these forms and qualities would encroach (sin), against either or both of the above laws of nature. In fact, the (absolute or necessary) form of a palm tree, or any other tree, may be constructed mathematically, if a few data be given. The highest or main aim of the palm is to bear its spike of flowers or fruits,—these are surrounded by leaves, required for the whole vegetative process of the plant. And now we call—must call, that palm beautiful, where all these organic processes (or rather their *external* typic exponents) are pushed to the highest degree of perfection, with the least amount of means and matter. And the same is the column, of which we say, *first*, that it is then beautiful, if it *correspond* with its prototype, whence it sprung,—could not *but* derive its form from. We shall transgress now to another analogous point, which will make our ideas centre and combine. As it is the destination of the trunk to bear *something*—leaves, flowers, and fruit—columns *also* have to bear something. And here, then, the beautiful in the architrave is *given*. There is a certain quiet, repose, rest in every thing perfect, beautiful, which imparts itself to the mind of the beholder; as quiet in mind-emotion is not excluding permeation and movement, but merely stagnation, languor. Hence, the beauty of a porch or colonnade will consist in the proper distribution (distance) of the columns, and in their (mathematical—nature-) shape compared with the architrave or roof they have to *bear*. *We* do not doubt, that if all this be mathematically true, the structure will be beautiful; but, even if *this* be not *conceded*, any one will agree, that if the proportions of the single columns, in relation to architrave and the whole scope of the structure (its plan and *aim*), be not nature-correct, the thing will, and can never be beautiful. Goethe says, that "it is by the horizontal line that we are human being,"—can alone be human beings. He is right. Civilisation, at least, begins with it. But we have to consider that *this* line (like any perfect mathematical figure), is also the most durable in construction, as are the arc and all arcoides.

Having thus *hastily* (we would almost say feebly) dispatched the structural part of the beautiful, we shall transgress to the *causation* of the beautiful in the human form, which, after all, may throw some further light on even our former statement. *The human form!*—We *northerns* can *know* nothing of human form; and this is mystically the reason why we can have no (fine) human form before us;

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